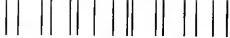




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Judges'
Retirement System
Actuarial Valuation
as of
July 1, 1990

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Section I

Introduction

An actuarial valuation of the Judges' Retirement System of the State of Montana has been completed as of July 1, 1990. This valuation was authorized by the Public Employees' Retirement Board under Section 19-5-201, MCA. The purpose of the valuation was to determine the financial position of the fund, the normal cost, and the unfunded accrued liability based upon present and prospective assets and liabilities of the system as of July 1, 1990.

Section II presents an analysis of the results of the actuarial valuation. The numerical findings and membership data supporting this analysis are shown in Section III.

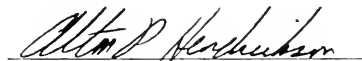
In conducting the actuarial valuation, certain assumptions were made as to the future experience of the system. A summary and discussion of each of the assumptions is contained in Section IV.

The valuation is based upon the Judges' Retirement Act and incorporates all amendments as of July 1, 1990. A summary of the major provisions of the Act is contained in Section V.

Actuarial Certification

The results of the actuarial valuation shown in this report are based upon information provided by the Public Employees' Retirement Division regarding plan participants, plan assets and other matters. The values have been calculated on the basis of actuarial assumptions which, in my opinion, are appropriate for purposes of this valuation.

This valuation has been prepared in accordance with generally accepted actuarial principles and practices and, to the best of my knowledge, fairly reflects the actuarial position of the Judges' Retirement System as of July 1, 1990.



Alton P. Hendrickson
Member, American Academy
of Actuaries

Section II

Analysis of Valuation

Results of Valuation

An actuarial valuation has been conducted as of July 1, 1990 for the Judges' Retirement System. This valuation has determined that the percentage of each member's salary required to fund the benefits as they accrue in the future is 41.263%. The regular contribution rate of 48.13% allows 6.867% to be applied to the unfunded past service liability. This percentage is sufficient to amortize the unfunded past service liability over a period of 26.72 years. This period has decreased from 35.01 years in 1988.

An amortization schedule has been prepared which will fund the liabilities as of July 1, 1984, July 1, 1986, and July 1, 1988 over the remaining periods of 34 years, 36 years, and 38 years, respectively. A new liability of -\$1,380,965 was determined as of July 1, 1990. This will be amortized over a 40-year period. The total contribution rate as a percentage of salary required to meet this schedule is 47.720%. This is an increase over the required rate of 45.133% in 1988. The schedule is illustrated on page 8.

The variations between this valuation and that of July 1, 1988 are the results of changes in the benefit accrual rate and the basis for valuing assets.

The Judges' Retirement System provides 50% of salary after the completion of 15 years of service. Through June 30, 1991, additional benefits are earned at the rate of 1% of salary for each additional year of service beyond 15 years. As of July 1, 1991, additional benefits will be earned at the rate of 1.785% for each year beyond 15 years. An additional contribution rate of 3.71% of salaries, which was determined necessary to fund this additional benefit, will also become effective July 1, 1991. This change is the main reason that the normal cost increased 3.488% from 37.775% to 41.263%.

The improved actuarial position of the Judges' Retirement System is largely attributable to the handling of the market value gain in assets. Prior to 1988, assets were based upon the cost value. In order to better recognize the actual financial position of the funds, the valuation now recognizes market value gain. To smooth the year to year fluctuations, each year's gain or loss is recognized over a six year period. This means that 1/6 of the gain or loss is recognized the first year, with an additional 1/6 recognized each year thereafter, until the full amount is recognized after 6 years. The table below illustrates this valuation:

Market Value as of 6/30/90	\$13,975,713
Cost Value as of 6/30/90	\$12,941,902
1990 Market Gain	16,452 x 1/6
1989 Market Gain	437,753 x 1/3
1988 Market Gain	-175,338 x 1/2
1987 Market Gain	-178,798 x 2/3
1986 Market Gain	775,701 x 5/6
Prior Market Gain	158,041

Adjusted Market Value	\$13,688,153

If the valuation had been based on cost value rather than market value, the amortization period of the unfunded liability would have increased to 34.29 years.

Contributions

The contribution rate used in this valuation was 48.130%. This is an increase of 3.275% over the contribution rate of 44.855% used in 1988. This difference arises from three sources. The additional contribution required to fund the benefit formula change was 3.71%. This increase was recognized in this valuation, although the actual contribution does not become effective until July 1, 1991. A second difference is that judges whose terms began prior to July 1, 1983 contribute an amount of 6% of salaries. All other judges contribute 7%. A third factor is that a portion of the contributions comes from 1/4 of the supreme court fees collected by the clerk. This amount varies from year to year and represents a smaller percent of salaries as salaries increase.

A point of concern is that filing fees submitted by the clerks of the district courts are to provide 31% of the salaries through June 30, 1991 and 34.71% thereafter. The actual court fees provide less than 25% of the salaries. This produces total contributions representing less than 38% of the payroll. This amount is not sufficient to pay the normal cost of benefits as they are earned in the future, and contributes no amount toward the funding of the unfunded past service liability. It is imperative that this situation be corrected.

For purposes of this valuation, it has been assumed that past funding short-fall will not be collected, but that future funding will be brought up to the statutory rate.

Summary of data

The active membership remains at 42 members with an annual payroll of \$2,199,120. The average age of the active members was 59.2 years in 1988. Because of the entry of younger judges, the average age has decreased to 57.3 years in 1990. The average salary was \$49,360 in 1988. This was increased to \$52,360 in 1990 because of a legislative salary increase.

The number of members receiving benefits grew from 21 in 1988 to 26 in 1990. These members received 6% benefit increases to reflect the salary increase to the active judges. Although benefits increased in general, the average benefit decreased from \$1,719 per month in 1980 to \$1,652 in 1990. This was a result of two judges who retired with relatively smaller benefits.

Conclusion

The actuarial assumptions were the same as those in the previous valuation of July 1, 1988. In spite of the underfunding in recent years, the financial position of the Judges' Retirement System has improved considerably. This was largely due to the greater recognition of the market value of assets. It was also attributable to the younger ages of new members.

Based upon the results of this valuation, the Judges' Retirement System is actuarially sound. However, this actuarial soundness will continue only if the funding is brought up to the required level.

Section III
Schedule 1
Judges' Retirement System
Normal Cost Allocation

(1) Normal Cost Contribution Rate:		
(a) Retirement		32.446%
(b) Death		3.756
(c) Disability		5.061

(d) Total Rate		41.263%
(2) Present Value of Future Salaries Of Current Members	\$	18,930,774
(4) Present Value of Future Normal Costs For Current Members (1(f) * (2))	\$	7,811,405

Schedule 2
Judges' Retirement System
Present Value of Benefits

(1) Present Value of Benefits - Inactive Members

(a) Retirement	\$ 5,658,171
(b) Death	240,440
(c) Disability	1,931,664
(d) Vested	1,463,632

(e) Total Inactive	\$ 9,293,907

(2) Present Value of Benefits - Active Members

(a) Retirement	\$ 12,978,032
(b) Death	1,114,670
(c) Disability	1,477,429

(d) Total Active	\$ 15,570,131

(3) Total Liabilities \$ 24,864,038

Schedule 3

Judges' Retirement System

Liability Allocation and Statutory Funding

(1) Unfunded Past Service Liability

(a) Present Value of Benefits	\$	24,864,038
(b) Present Value of Future Normal Costs	\$	7,811,405
(c) Fund Assets	\$	13,688,153

(d) Unfunded Liability (a)-(b)-(c)	\$	3,364,480

(2) Contribution Rates Amortized over 26.72 Years

(a) Present Value of Salaries During Next 26.72 Years	\$	48,994,922
(b) Unfunded Contribution Rate $1(d)/2(a)$		6.867%
(c) Normal Cost Rate (Schedule 1)		41.263

(d) Statutory Funding Rate		48.130%

Schedule 4

Judges' Retirement System

Unfunded Liability Amortization Schedule

(1) Biennial Unfunded Past Service Liability Accounts

1984 Liability Account as of 7/1/88	\$	8,605,793
Interest Charge on Liability Account		1,432,004
Contributions Applied to Liability		-17,947
Interest Credit on Contributions		-1,384
1984 Liability Account as of 7/1/90	\$	10,057,128
1986 Liability Account as of 7/1/88	\$	-2,684,322
Interest Charge on Liability Account		-446,671
Contributions Applied to Liability		5,598
Interest Credit on Contributions		432
1986 Liability Account as of 7/1/90	\$	-3,137,023
1988 Liability Account as of 7/1/88	\$	-1,860,837
Interest Charge on Liability Account		-309,643
Contributions Applied to Liability		3,881
Interest Credit on Contributions		299
1988 Liability Account as of 7/1/90	\$	-2,174,660

(2) Actuarial Gain/Loss

Current Unfunded Liability (Schedule 3)	\$	3,364,480
Less 1984 Liability Account		10,057,128
Less 1986 Liability Account		-3,137,023
Less 1988 Liability Account		-2,174,660

1990 Liability Account as of 7/1/90	\$	-1,380,965

(3) Required Contribution Rate

Normal Cost Rate (Schedule 1)	41.263%
Rate to Fund 1984 Liability Over 34 Years	16.911
Rate to Fund 1986 Liability Over 36 Years	-5.046
Rate to Fund 1988 Liability Over 38 Years	-3.357
Rate to Fund 1990 Liability Over 40 Years	-2.051

Contribution Rate for 40-Year Schedule	47.720%

Schedule 5
Judges' Retirement System
Comparison of Valuations

	<u>1988</u>	<u>1990</u>
(1) Unfunded Past Service Liability		
(a) Present Value of Benefits	\$20,118,955	\$24,864,038
(b) Present Value of Future Costs	\$ 5,658,294	\$ 7,811,405
(c) Fund Assets	\$10,400,027	\$13,688,153
(d) Unfunded Liability	\$ 4,060,634	\$ 3,233,806
(2) Amortization Period and Contribution Rates		
(a) Years for Amortization	35.01	26.72
(b) Unfunded Contribution Rate	7.080%	6.867%
(c) Normal Cost Rate	37.775	41.263
(d) Statutory Funding Rate	44.855%	48.130%
(e) Amortization Schedule Rate*	45.133%	47.526%
(3) Active Members		
(a) Number of Members	42	42
(b) Annual Payroll	\$ 2,073,120	\$ 2,199,120
(c) Average Annual Salary	\$ 49,364	\$ 52,360
(4) Inactive Members		
(a) Number of Retired	16	20
(b) Number of Disabled	4	5
(c) Number of Survivors	1	1
(d) Number of Vested Deferred	5	5
(e) Annual Benefits	\$ 433,104	\$ 515,442
(f) Average Monthly Benefit	\$ 1,719	\$ 1,652

* Rate required to amortize each year's new liabilities over 40 years.

Schedule 6

Table 1

Judges' Retirement System

Number of Active Members

Years of Service	Member's Age									Total
	20-25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	OVER 60	
0-4				1	4	2		3	2	12
5-9						5	3	1	9	18
10-14						2			5	7
15-19									1	1
20-24								1		1
25-29								1	2	3
30-34										
35-39										
40-UP										
Total				1	4	9	3	6	19	42

Table 2
Judges' Retirement System
Average Salaries of Active Members

Years of Service	Member's Age									Total
	20-25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	OVER 60	
0-4				52178	52178	52178		52178	52178	52178
5-9						52178	52178	52178	52603	52390
10-14						52815			52433	52542
15-19									52178	52178
20-24								52178		52178
25-29								52178	52815	52603
30-34										
35-39										
40-UP										
Total				52178	52178	52320	52178	52178	52513	52360

Table 3
Judges' Retirement System
Number of Vested Inactive Members

Years of Service	Member's Age									Total
	20-25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	OVER 60	
0-4										
5-9							1		1	2
10-14									2	2
15-19									1	1
20-24										
25-29										
30-34										
35-39										
40-UP										
Total							1		4	5

Table 4
Judges' Retirement System
Number of Retired Members

Member's Service	Recipient's Age									Total
	< 45	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Over 80	
0-4										
5-9							2			2
10-14						1	1	1	1	4
15-19				1		1	2	2	1	7
20-24								3		3
25-29						1	1	1		3
30-34									1	1
35-39										
40-UP										
Total				1		3	6	7	3	20

Table 5
Judges' Retirement System
Average Benefits of Retired Members

Member's Service	Recipient's Age									
	< 45	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Over 80	Total
0-4										
5-9							803			803
10-14						1344	1551	1578	818	1323
15-19				2304		1812	1537	1754	1131	1690
20-24								1903		1903
25-29						2469	1254	1953		1892
30-34									1312	1312
35-39										
40-UP										
Total				2304		1875	1247	1821	1087	1571

Table 6
Judges' Retirement System
Number of Disabled Members

Member's Service	Recipient's Age									Total
	< 45	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Over 80	
0-4										
5-9										
10-14						1				1
15-19							2			2
20-24					1					1
25-29								1		1
30-34										
35-39										
40-UP										
Total					1	1	2	1		5

Table 7
Judges' Retirement System
Average Benefits of Disabled Members

Member's Service	Recipient's Age									
	< 45	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Over 80	Total
0-4										
5-9										
10-14						1776				1776
15-19							2078			2078
20-24					2073					2073
25-29								2652		2652
30-34										
35-39										
40-UP										
Total					2073	1776	2078	2652		2131

Table 8
Judges' Retirement System
Number of Survivors

Member's Service	Recipient's Age									Total
	< 45	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Over 80	
0-4										
5-9					1					1
10-14										
15-19										
20-24										
25-29										
30-34										
35-39										
40-UP										
Total					1					1

Table 9
Judges' Retirement System
Average Benefits of Survivors

Member's Service	Recipient's Age								Total
	< 45	45-49	50-54	55-59	60-64	65-69	70-74	75-79 Over 80	
0-4									
5-9					874				874
10-14									
15-19									
20-24									
25-29									
30-34									
35-39									
40-UP									
Total					874				874

Section IV

Actuarial Funding Method

The true cost of the Judges' Retirement System will be determined by its future experience. In determining the financial requirement of the fund, certain assumptions were made as to the expected future experience. This section summarizes the funding method applied as well as the basic assumptions used.

Any variations in the actual experience of the fund from those assumed in this valuation may cause changes in the projected future costs of the fund. It is therefore necessary that the actuarial assumptions be reviewed from time to time with adjustments as experience warrants. It is also important that regular valuations be performed to determine the financial effect of variations between the actual and assumed experience.

The assumptions shown below were based upon the past experience of the fund together with the projections as to future experience.

The method of funding employed is commonly referred to as the entry age normal cost method. This method establishes a normal cost of each fund as well as an unfunded accrued liability. The normal cost is the level percentage of total salaries required to fund the benefits, assuming this percentage has been contributed since each member's entry into the fund.

The unfunded accrued liability represents the excess of the present value of total liabilities over the present assets of the fund and the present value of expected future contributions for the normal cost.

In order to maintain the fund on an actuarially sound basis, the rate of contribution should be such as to meet the normal cost in addition to making progress towards the amortization of the unfunded liability.

Discussion of Actuarial Assumptions

Mortality Rates

The mortality rates for males and females are based upon the 1983 Group Annuity Mortality Table, and apply to both active members and those receiving benefits.

Disability Rates

The disability rates for males and females are based upon the 1983 Disability Table.

Withdrawal Rates

No withdrawal assumptions were used.

Salary Scale

The rates of salary increase are based upon an assumed compounded growth rate of 6.5% per annum.

Investment Earnings

It was assumed that the investment earnings would be 8% compounded annually.

Administrative Expenses

It was assumed that the system would incur no administrative expenses beyond those provided by investment earnings in excess of 8%.

Illustration of Actuarial Assumptions

Mortality Rates

The mortality rates are based upon the 1983 Group Annuity Mortality Table.

<u>Age</u>	<u>Deaths Per 10,000 Male Members</u>	<u>Deaths Per 10,000 Female Members</u>
25	5	3
30	6	3
35	9	5
40	12	7
45	22	10
50	39	16
55	61	25
60	92	42
65	156	71
70	275	124
75	446	240
80	741	429
85	1,148	699

Disability Rates

The disability rates are based upon the 1983 Disability Table.

<u>Age</u>	<u>Disabilities per 10,000 Male Members</u>	<u>Disabilities per 10,000 Female Members</u>
25	1	1
30	2	3
35	3	5
40	6	9
45	12	15
50	20	22
55	51	41
60	105	87

Salary Scale

The salary increases are based upon an assumed compounded growth rate of 6.5% per annum.

Investment Earnings

Future investment earnings are assumed to be 8% compounded annually.

Administrative Expenses

It was assumed that the administrative expenses would be recovered by investment earnings in excess of 8%.

Section V

Summary of Benefits and Contributions

Effective Date -	July 1, 1967
Member Contributions -	6% of salary for each judge employed prior to July 1, 1983 and 7% of salary for each judge whose term begins on or after July 1, 1983.
State Contributions -	6% of active judges' salaries.
Court Fees -	31% of salaries from district court fees with an additional amount of 3.71% effective July 1, 1991, plus one-fourth of the supreme court fees.
Retirement Benefit -	<p>Minimum service: 5 years Minimum age: 65</p> <p>Normal form: Life annuity with a death benefit equal to the present value of the retirement allowance at the date of retirement less retirement benefits paid to date (full cash refund annuity).</p> <p>Benefit: $3\frac{1}{3}\%$ of the current monthly salary for the office retired from for each of the first 15 years of service, plus 1.785% per year of such monthly salary for each year of service in excess of 15 years.</p>
Disability Benefit -	<p>Service disability: Greater of 50% of monthly salary and accrued retirement benefit.</p> <p>Nonservice disability: Actuarial equivalent of the accrued retirement benefit, or accrued retirement benefit if over age 60.</p>
Death Benefit -	<p>Service death: Accrued retirement benefit.</p> <p>Nonservice death: Actuarial equivalent of the accrued retirement benefit.</p>

Termination Benefit -

Prior to completion of 5 years of service, return of accumulated contributions without interest. After 5 years but less than 12 years of service, either return of accumulated contributions with interest or the actuarial equivalent of the accrued retirement benefit.

Judges employed prior to July 1, 1983 are entitled to the accrued retirement benefit if service is involuntarily terminated after 12 or more years of service.





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